

Applicant : Bruce B. Roesner, Ph.D.  
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Attorney's Docket No.: 16165-005001

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) A passive radio frequency identification tag comprising:  
an antenna;  
a radio frequency interface coupled with the antenna; and  
control logic that initiates a deep sleep state in response to an event, the deep sleep state comprising a non-responsive state that is independent of supplied power, and the control logic providing a following state entered upon conclusion of the non-responsive state, wherein communications initiate from the following state.
2. (original) The passive radio frequency identification tag of claim 1, wherein the following state comprises an initial communication state from a plurality of communication states, wherein the plurality of communication states allow response to a sequence of associated commands when receipt of the command sequence begins in the initial communication state.
3. (original) The passive radio frequency identification tag of claim 2, wherein the command sequence comprises at least a portion of a binary search protocol.

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4. (original) The passive radio frequency identification tag of claim 2, wherein the deep sleep state initiates in response to an event comprising receipt of a deep sleep command.

5. (original) The passive radio frequency identification tag of claim 4, wherein the non-responsive state concludes in response to a first occurring event from events comprising receipt of a wake command and internal cessation of the non-responsive state.

6. (original) The passive radio frequency identification tag of claim 5, where the control logic further provides a sleep state that is entered upon power up and an isolate state that is entered upon receipt of an isolate command, the sleep and isolate states being dependent upon supplied power, wherein the sleep, isolate and non-responsive states conclude upon receipt of a full wake command, and the sleep and isolate states, but not the non-responsive state, conclude upon receipt of a partial wake command.

7. (original) The passive radio frequency identification tag of claim 5, where the control logic further provides a sleep state that is entered upon power up and an isolate state that is entered upon receipt of an isolate command, the sleep and isolate states being dependent upon supplied power, wherein the sleep and non-responsive states, but not the isolate state, conclude upon receipt of a full wake command, and the sleep and isolate states, but not the non-responsive state, conclude upon receipt of a partial wake command.

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8. (original) The passive radio frequency identification tag of claim 5, where the control logic further provides a sleep state that is entered upon power up and an isolate state that is entered upon receipt of an isolate command, the sleep and isolate states being dependent upon supplied power, wherein the sleep and non-responsive states, but not the isolate state, conclude upon receipt of a full wake command, and the sleep state, but not the isolate and non-responsive states, conclude upon receipt of a partial wake command.

9. (original) The passive radio frequency identification tag of claim 5, where the control logic further provides a sleep state that is entered upon power up and an isolate state that is entered upon receipt of an isolate command, the sleep and isolate states being dependent upon supplied power, wherein the sleep, isolate and non-responsive states conclude upon receipt of a full wake command, and the sleep state, but not the isolate and non-responsive states, conclude upon receipt of a partial wake command.

10. (original) The passive radio frequency identification tag of claim 5, where the radio frequency interface comprises an analog portion of a complementary metal oxide semiconductor (CMOS) integrated circuit (IC), the control logic comprises a digital portion of the CMOS IC, and the internal cessation of the non-responsive state comprises a voltage decay of a charged RC circuit in the CMOS IC.

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11. (original) The passive radio frequency identification tag of claim 1, wherein the non-responsive state concludes upon internal cessation, the following state comprises an isolate state, and the deep sleep and isolate states conclude upon receipt of a full wake command.

12. (original) The passive radio frequency identification tag of claim 1, wherein the non-responsive state concludes upon internal cessation, the following state comprises the non-responsive state reinitiated, and the deep sleep state concludes upon receipt of a full wake command.

13. (original) The passive radio frequency identification tag of claim 1, wherein the antenna comprises a near-field coupling element configured to operate in a high frequency band.

14. (original) The passive radio frequency identification tag of claim 1, further comprising a non-volatile memory.

15. (original) A method comprising:  
receiving power in a passive radio frequency identification tag;  
receiving commands in a command structure in the passive radio frequency identification tag; and  
entering a deep sleep state in the passive radio frequency identification tag, the deep sleep state comprising a reset of the command structure and a non-responsive state that is independent of supplied power.

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16. (original) The method of claim 15, wherein entering the deep sleep state comprises entering the deep sleep state in response to a deep sleep command.

17. (original) The method of claim 15, further comprising leaving the deep sleep state in response to a first occurring event from events comprising receipt of a wake command and internal cessation of the non-responsive state.

18. (original) The method of claim 17, wherein the internal cessation of the non-responsive state comprises a voltage decay of a charged RC circuit.

19. (original) A system comprising:  
a radio frequency identification (RFID) tag reader that sends commands including at least one sequence of associated commands used to identify an RFID tag on an article; and  
multiple passive RFID tags, each tag being attached to an article and each tag comprising a radio frequency sub-system and control logic coupled with the radio frequency sub-system, wherein the control logic resets tag communications and initiates a non-responsive state in response to at least one event, the non-responsive state being independent of supplied power, and the control logic responds to a wake command but ignores other commands in the command sequence while the tag is in the non-responsive state, and the wake command response concludes the non-responsive state.

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20. (original) The system of claim 19, wherein the control logic further provides a sleep state that is entered upon power up and an isolate state that is entered upon receipt of an isolate command, the sleep and isolate states being dependent upon supplied power, wherein the sleep, isolate and non-responsive states conclude upon receipt of a full wake command, and the sleep and isolate states, but not the non-responsive state, conclude upon receipt of a partial wake command.

21. (original) The system of claim 19, wherein the control logic further provides a sleep state that is entered upon power up and an isolate state that is entered upon receipt of an isolate command, the sleep and isolate states being dependent upon supplied power, wherein the sleep and non-responsive states, but not the isolate state, conclude upon receipt of a full wake command, and the sleep and isolate states, but not the non-responsive state, conclude upon receipt of a partial wake command.

22. (original) The system of claim 19, wherein the control logic further provides a sleep state that is entered upon power up and an isolate state that is entered upon receipt of an isolate command, the sleep and isolate states being dependent upon supplied power, wherein the sleep and non-responsive states, but not the isolate state, conclude upon receipt of a full wake command, and the sleep state, but not the isolate and non-responsive states, conclude upon receipt of a partial wake command.

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23. (original) The system of claim 19, wherein the control logic further provides a sleep state that is entered upon power up and an isolate state that is entered upon receipt of an isolate command, the sleep and isolate states being dependent upon supplied power, wherein the sleep, isolate and non-responsive states conclude upon receipt of a full wake command, and the sleep state, but not the isolate and non-responsive states, conclude upon receipt of a partial wake command.

24. (original) The system of claim 19, wherein the non-responsive state also concludes upon internal cessation.

25. (original) The system of claim 24, wherein each tag comprises an antenna and an integrated circuit (IC) that comprise the radio frequency sub-system and the control logic, and the internal cessation of the non-responsive state comprises a voltage decay of a charged RC circuit in the IC.

26. (original) The system of claim 25, wherein the antenna comprises a near-field coupling element configured to operate in a high frequency band, and the IC further comprises a non-volatile memory.

27. (original) A passive radio frequency identification tag comprising:  
means for receiving power and commands in a command structure; and  
means for entering a deep sleep state comprising a reset of the command structure and a non-responsive state that is independent of supplied power.

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28. (original) The passive radio frequency identification tag of claim 27, wherein the means for entering the deep sleep state comprise:  
means for preventing premature triggering of the deep sleep state; and  
means for maintaining the deep sleep state when power is reapplied after loss of the received power.